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FINAL TECHNICAL REPORT FOR CONTRACT # MDA90381-C-0017

Implementation of Command and Control Training Systems

submitted by:

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June 15, 1982

Sponsored by:

Defense Advanced Research Projects Agency (DoD)
Arpa Order # 4018
under contract # MDA90381-C-0017
effective: Nov 24 1980
expiration: Nov 23 1981

Issued by:

Department of Army, Defense Supply Service - Washington
Washington, D.C.
20310

Prepared for:

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Report Summary

This is the final technical report for the research conducted under the DARPA contract # MDA90381-C-0017. During the course of this contract Computing Analysis Corporation served as the focal point for all services relative to the use of the ARPANET. Major areas of responsibility were:

- (1) The development and implementation of an ARPANET training program for the DARPA staff, selected agents and contractors.
2. The development of a comprehensive ARPANET User's Guide for the DARPA staff and DARPA sponsored ARPANET users.
3. The development and implementation of procedures to monitor ARPANET usage by the DARPA testbed-user community, to include the addition of new users; deletion of departing users; and a quarterly review of DARPA sponsored users to ensure that DARPA sponsorship would still be desirable.
4. The quarterly preparation of a submission to the Network Information Center (NIC) relating to the DARPA users of ARPANET hosts, - A. X
5. The provision of responsive ARPANET user support services for the DARPA staff, its agents, and selected contractors.

Throughout this contract we have reported the details of our efforts in the form of weekly status reports. In the following sections we provide a brief summary under the various categories indicated above.

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1. The Development of an ARPANET Training Program

The DARPA information processing technology testbed provides an ideal environment for the research and development of an advanced training program. Because of the variety and complexity of ARPANET systems it was necessary to develop a training program of unusual dimensions.

Initially a review and evaluation of systems and subsystems available via the ARPANET were undertaken. Training programs were developed for those systems which were determined to best meet the needs and functions of the DARPA user.

A hierarchy of systems to be taught was combined with a matrix approach to the users themselves. Curricula for introductory, intermediate, and advanced classes were developed. Visual aids for each level were designed for the classroom and handouts. Tutorials were developed to ensure that each student was conceptually prepared for the information processing environment. All training sessions included opportunities for 'hands on' user involvement to familiarize the user with a variety of terminals and interactive processes.

Both formal and informal sessions were provided for the DARPA staff, agents and selected contractors. Formal seminars in ARPANET message systems (MSG, HERMES), text editors (TECO, SOS, TVEDIT) and text processors (RUNOFF, SCRIBE) were supplemented with training on basic ARPANET concepts, operating system commands, and the use of DARPA printer systems. Informal sessions frequently were used for review and/or specialized applications.

2. The Development of an ARPANET User's Guide.

Because of the research nature of ARPANET systems, technical documentation is often cryptic and difficult to absorb. Additionally the volume of system modules is large and the diversity of system characteristics is broad.

In exploring ways to solve this problem Computing Analysis Corporation developed an outline and sample segments of an ARPANET User's Guide. The guide was designed to integrate all aspects of DARPA ARPANET use including timesharing, ARPANET concepts and the major subsystems available on the NET. Several styles and formats were experimented with until the proper mixture of explanatory text vs examples was achieved.

3. The Development and Maintenance of a DARPA Sponsored User List.

DARPA users of ARPANET Systems constitute a very large and turbulent user community. Major personnel shifts occur on the average of every eighteen months. Additionally, the Agency's programmatic plans frequently receive major redirections which impact the information requirements of the staff.

Traditionally the DARPA staff member, agent and/or contractor utilize at least three different ARPANET hosts to perform collaborative research efforts, to communicate in a message-sending mode or to access financial management and/or administrative information.

In order to ensure that proper control existed for the use of ARPANET systems in this environment, Computing Analysis Corporation developed an ARPANET user control system. New users were provided with directories within the correct accounts and system access at ARPANET hosts most suited to their needs; access to printers and other peripheral equipment was also arranged.

The directory and account structures were reviewed periodically to ensure accuracy, and deletions and corrections were made accordingly.

4. Network Information Center Submission

Computing Analysis Corporation responded to the Network Information Center (NIC) request for timely information on the DARPA staff, Agents, and contractor use of ARPANET Hosts by providing an in depth report which included the systems and Hosts utilized by each DARPA supported user, and the resources supported by the TIP Liaison.

Additionally, quarterly reports were provided to the Defense Communications Agency (DCA) and the Network Information Center (NIC) relating to the configuration of the DARPA Terminal Interface Processor (TIP), port speeds, port configuration, sponsorship, and port allocation.

5. ARPANET User Support

In addition to the formalized ARPANET Training Program it developed, Computing Analysis Corporation was heavily involved in informal user assistance for the DARPA staff during this contract. As the ARPANET service support group, the Computing Analysis Corporation staff responded to a large volume of inquiries involving telecommunications; networking; terminal functions; the DARPA port contender; and ARPANET systems. As our weekly status reports indicate, over 25% of the on-site Computing Analysis Corporation staff involvement was directed toward the resolution of queries and/or problems.